Part I Assignment

```
osc@ubuntu:~/final-src-osc10e/ch2$ make
make -C /lib/modules/4.4.0-87-generic/build M=/home/osc/final-src-osc10e/ch2 modules
make[1]: Entering directory '/usr/src/linux-headers-4.4.0-87-generic'
  CC [M]  /home/osc/final-src-osc10e/ch2/simple.o
  Building modules, stage 2.
  MODPOST 1 modules
  CC      /home/osc/final-src-osc10e/ch2/simple.mod.o
  LD [M]  /home/osc/final-src-osc10e/ch2/simple.ko
make[1]: Leaving directory '/usr/src/linux-headers-4.4.0-87-generic'
```

make

```
ser"
[    9.189321] audit: type=1400 audit(1712868750.500:8): apparmor="STATUS" operation="profile_load"
profile="unconfined" name="/usr/lib/NetworkManager/nm-dhcp-helper" pid=569 comm="apparmor_parser"
[    9.189331] audit: type=1400 audit(1712868750.500:9): apparmor="STATUS" operation="profile_load"
profile="unconfined" name="/usr/lib/connman/scripts/dhclient-script" pid=569 comm="apparmor_parser"
[    9.194851] audit: type=1400 audit(1712868750.508:10): apparmor="STATUS" operation="profile_load"
 profile="unconfined" name="/usr/bin/lxc-start" pid=573 comm="apparmor_parser"
[    9.200368] audit: type=1400 audit(1712868750.512:11): apparmor="STATUS" operation="profile_load"
 profile="unconfined" name="/usr/lib/lxd/lxd-bridge-proxy" pid=575 comm="apparmor_parser"
[    9.321688] piix4_smbus 0000:00:07.0: SMBus Host Controller at 0x4100, revision 0
[    9.335151] vgdrvHeartbeatInit: Setting up heartbeat to trigger every 2000 milliseconds
[    9.335233] input: Unspecified device as /devices/pci0000:00/0000:00:04.0/input/input7
[    9.352425] vboxguest: misc device minor 55, IRQ 20, I/O port d020, MMIO at 00000000f0400000 (siz
e 0x400000)
[    9.352426] vboxguest: Successfully loaded version 5.0.18_Ubuntu (interface 0x00010004)
[    9.495679] snd_intel8x0 0000:00:05.0: disable (unknown or VT-d) VM optimization
[    9.552799] [drm] Initialized drm 1.1.0 20060810
[    9.682561] e1000: enp0s3 NIC Link is Up 1000 Mbps Full Duplex, Flow Control: RX
[    9.838172] snd_intel8x0 0000:00:05.0: white list rate for 1028:0177 is 48000
[    9.839585] [drm] VRAM 01000000
[    9.843108] [TTM] Zone  kernel: Available graphics memory: 379024 kiB
[    9.843109] [TTM] Initializing pool allocator
[    9.843112] [TTM] Initializing DMA pool allocator
[    9.848976] fbcon: vboxdrmfb (fb0) is primary device
[    9.984398] Console: switching to colour frame buffer device 100x37
[   10.046166] vboxvideo 0000:00:02.0: fb0: vboxdrmfb frame buffer device
[   10.048922] [drm] Initialized vboxvideo 1.0.0 20130823 for 0000:00:02.0 on minor 0
[   10.078627] ppdev: user-space parallel port driver
[   10.184071] Adding 784380k swap on /dev/sda5.  Priority:-1 extents:1 across:784380k FS
[   10.347893] cgroup: new mount options do not match the existing superblock, will be ignored
[   12.086001] floppy0: no floppy controllers found
[  511.944477] simple: module verification failed: signature and/or required key missing - tainting
kernel
[  511.945143] Loading Module
osc@ubuntu:~/final-src-osc10e/ch2$ lsmod | grep simple
simple                 16384  0
osc@ubuntu:~/final-src-osc10e/ch2$
```

sudo insmod simple.ko
dmesg
lsmod | grep simple

```
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[  511.944477] simple: module verification failed: signature and/or required key missing - tainting
kernel
[  511.945143] Loading Module
[  794.879751] Removing Module
osc@ubuntu:~/final-src-osc10e/ch2$ lsmod | grep simple
osc@ubuntu:~/final-src-osc10e/ch2$
```

sudo rmmod simple
dmesg
lsmod | grep simple


```
profile="unconfined" name="/usr/lib/NetworkManager/nm-dhcp-client.action" pid=569 comm="apparmor_par
ser"
[    9.189321] audit: type=1400 audit(1712868750.500:8): apparmor="STATUS" operation="profile_load
profile="unconfined" name="/usr/lib/NetworkManager/nm-dhcp-helper" pid=569 comm="apparmor_parser"
[    9.189331] audit: type=1400 audit(1712868750.500:9): apparmor="STATUS" operation="profile_load
profile="unconfined" name="/usr/lib/connman/scripts/dhclient-script" pid=569 comm="apparmor_parser"
[    9.194851] audit: type=1400 audit(1712868750.508:10): apparmor="STATUS" operation="profile_load
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[  511.944477] simple: module verification failed: signature and/or required key missing - tainting
kernel
[  511.945143] Loading Module
[  794.879751] Removing Module
osc@ubuntu:~/final-src-osc10e/ch2$
```

sudo dmesg -c

Part II Assignment

```
osc@ubuntu:~/final-src-osc10e/part2Assignment$ make
make -C /lib/modules/4.4.0-87-generic/build M=/home/osc/final-src-osc10e/part2Assignment modules
make[1]: Entering directory '/usr/src/linux-headers-4.4.0-87-generic'
  Building modules, stage 2.
  MODPOST 1 modules
make[1]: Leaving directory '/usr/src/linux-headers-4.4.0-87-generic'
osc@ubuntu:~/final-src-osc10e/part2Assignment$ _
```

make

```
osc@ubuntu:~/final-src-osc10e/part2Assignment$ sudo insmod part2.ko
[sudo] password for osc:
osc@ubuntu:~/final-src-osc10e/part2Assignment$ dmesg
[ 2765.501562] No module found in object
[ 2836.825560] No module found in object
[ 2971.960679] part1: module license 'unspecified' taints kernel.
[ 2971.960714] Disabling lock debugging due to kernel taint
[ 2971.961396] Loading Module
[ 3016.767635] Removing Module
[ 3165.850772] Loading Module
[ 6846.612156] Loading Module
[ 6846.612158] Birthdays:
[ 6846.612159] Birthday: 3/10/2002
[ 6846.612159] Birthday: 3/27/2002
[ 6846.612160] Birthday: 6/4/2002
[ 6846.612160] Birthday: 6/4/1993
[ 6846.612161] Birthday: 4/14/1995
osc@ubuntu:~/final-src-osc10e/part2Assignment$ lsmod | grep part2
part2                 16384  0
osc@ubuntu:~/final-src-osc10e/part2Assignment$ _
```

Sudo insmod part2.ko
Dmesg
Lsmod | grep part2

```
osc@ubuntu:~/final-src-osc10e/part2Assignment$ sudo rmmod part2
osc@ubuntu:~/final-src-osc10e/part2Assignment$ dmesg
[ 2765.501562] No module found in object
[ 2836.825560] No module found in object
[ 2971.960679] part1: module license 'unspecified' taints kernel.
[ 2971.960714] Disabling lock debugging due to kernel taint
[ 2971.961396] Loading Module
[ 3016.767635] Removing Module
[ 3165.850772] Loading Module
[ 6846.612156] Loading Module
[ 6846.612158] Birthdays:
[ 6846.612159] Birthday: 3/10/2002
[ 6846.612159] Birthday: 3/27/2002
[ 6846.612160] Birthday: 6/4/2002
[ 6846.612160] Birthday: 6/4/1993
[ 6846.612161] Birthday: 4/14/1995
[ 6975.911822] Removing Module
osc@ubuntu:~/final-src-osc10e/part2Assignment$ lsmod | grep part2
osc@ubuntu:~/final-src-osc10e/part2Assignment$
```

Sudo rmmod part2
Dmesg
Lsmod | grep part2